Adjustable conveyor fork

1,8T 180FG-2-4 without sideshift
1,8T 180FG-2-4SV sideshift ISO KI 2 ± 100 mm
Table of Contents

1. Introduction ........................................................................................................ 4
   1.1 Working with this manual ........................................................................ 4
   1.2 Warning notes and symbols ..................................................................... 4
   1.3 Copyright ..................................................................................................... 4
   1.4 CE-Mark ...................................................................................................... 5
   1.5 Qualified and authorised personnel ......................................................... 5
   1.6 Warranty claims based on defects .............................................................. 5
   1.7 Limits of applicable use ............................................................................. 5

2. Safety aspects ...................................................................................................... 6

3. Design .................................................................................................................. 7
   3.1 Proper use of the equipment ................................................................. 7
   3.2 Improper use .............................................................................................. 8

4. Installation and checking out ............................................................................. 8
   4.1 Installation ................................................................................................. 8
   4.2 Checking out .............................................................................................. 10
      4.2.1 Bleeding the hydraulic system ......................................................... 10
      4.2.2 Adjustment after putting into service .............................................. 10

5. Operation ............................................................................................................ 10
   5.1 General ....................................................................................................... 10
   5.2 Load handling ............................................................................................. 11
   5.3 Driving ........................................................................................................ 11
6. Maintenance and servicing

6.1 General

6.2 Significant modification

6.3 Schedule for routine maintenance and lubricants

6.3.1 Modell 2T180FG-2-4 / 2T180FG-2-4SV

6.3.2 Identification plate and caution board

7. Troubleshooting

8. Disposal

9. Transport

10. Decommissioning and storage

11. Spare parts list (not part of the Operating Manual)

12. EC Declaration of Conformity (Summary)

Our service department in Aschaffenburg will be happy to answer your technical questions and to provide additional support.

Technical Support:
0049 (0) 6021 865 395
0049 (0) 6021 865 284
0049 (0) 6021 865 352

Orders for spare parts Domestic
0049 (0) 6021 865205
0049 (0) 6021 865251

Orders for spare parts Export
0049 (0) 6021 865344
0049 (0) 6021 865348

Outside of normal business hours the Kaup – Service Hotline is available to you 365 days a year:
0049 (0) 172 6295 297
Monday - Friday: 17:00 – 7:00 Uhr
Saturday und Sunday: 8:00 – 18:00 Uhr

Kaup GmbH & Co KG • Braunstr. 17 • D-63741 Aschaffenburg • email: kaup@kaup.de • www.kaup.de
1. Introduction

1.1 Working with this manual

This operating manual contains important information on how to operate the attachment properly, safely and efficiently.

The operating manual shall be read, understood and applied by all personnel working on or with the equipment, for example:

- Installation and operating the equipment
- Inspection, maintenance and repair
- Transport and disposal

The manual must be kept available for ready reference at the equipment’s place of use.

The illustrations in this operating manual may deviate from the actual version of the equipment.

1.2 Warning notes and symbols

The following symbols are used in this operating manual to highlight details of special importance:

⚠️ Identifies details relating to do’s and don’ts for the purpose of avoiding injury and property damage.

🖼️ Specific details relating to the efficient use of the attachment and other advice.

☐ Lists are denoted by a shadowed box.

- Steps to be performed by the operator are denoted by a black dot.

(1) In illustrations, particular elements have numbered pointers. Numbers in brackets in the text refer to the corresponding elements.

1.3 Copyright

This documentation including all parts is copyrighted. Any use or change outside the narrow limits of copyright law without permission from KAUP GmbH & Co KG is forbidden and liable to prosecution. This applies, in particular, to reproduction, translation, microfilming as well as storage and processing in electronic systems.
1.4 **CE-Mark**

KAUP-Attachments carry the CE-mark. The EC Declaration of Conformity ensures that the attachment conforms to the EC machinery guideline.

1.5 **Qualified and authorised personnel**

Qualified and authorised personnel are equipped by way of their education and training to perform the tasks assigned to them in accordance with accepted practice and safety regulations. They are assigned tasks by the equipment owner.

1.6 **Warranty claims based on defects**

KAUP shall not be liable for any damage to the equipment resulting from:

- Improper use / operation.
- Modifications to components.
- Inappropriate installation, maintenance, inspection and servicing.
- Assignment of unqualified or non-authorised personnel.
- Claims raised by third parties.

1.7 **Limits of applicable use**

KAUP-attachments are intended for use under the following climatic conditions:

- Average ambient temperature for continuous operation: +25°C
- Allowable maximum ambient temperature, short term (up to 1h): +40°C
- Allowable minimum ambient temperature for attachments intended for indoor use: +5°C
- Allowable minimum ambient temperature for attachments intended for outdoor use: -20°C

Standard models of KAUP-attachments are NOT suitable for:

- Use in cold storage facilities.
- Use in explosive environments.
- Use in conjunction with hydraulic systems involving biological oils.
- Use in rough environmental conditions (e.g. seawater)
- The transport of acidic liquids.
2. Safety aspects

As the user, extend the safety instructions with generally applicable, legal and other measures that ensure a safe and environmentally friendly operation of the attachment.

Pay close attention to all safety- and danger-related signs on the attachment and in this operating manual. Failure to observe these can result in severe injury or even death.

Pay close attention to the operating manual provided by the manufacturer of the fork lift truck.

Keep a safe distance away from moving, reciprocating or rotating parts of the attachment to avoid danger of crushing, pinching or entanglement.

Notify the responsible department/person immediately of changes and faults in operation of the attachment that affect safety.

The attachment shall be shut down.

Use aids to vision (e.g. mirrors, camera, etc.) where goods being transported obstruct vision.

Only allow work on the attachment to be carried out by qualified and authorised persons. Adhere to the legal minimum age in the country of operation!

The attachment should only be used for the purpose intended.

Never work on or with attachments while under the influence of drugs, alcohol or medicines which affect reaction time.
3. Design

An adjustable conveyor fork consists of a centre (1) transport fork as well as of a right (2) and left (3) transport fork. Toothed belts (4) are operated by means of a toothed pulley (5, 6). They are driven by hydraulic motors (7). A wear strip (8) is bolted to the fork tip. With the upper guide (9) and bolted lower brackets (10), the transport fork is installed on the fork carriage of the lift truck. The forks are adjusted by means of a cylinder (11).

For the 1,8T 180FG-2-4SV model, sideshift is possible by means of cylinder (12). For the 1,8T 180FG-2-4 model (without sideshift), a rod is installed instead of the cylinder (12).

3.1 Proper use of the equipment

Transport forks are designed to pick up loads from the floor and to place them on pallets and to push the load off the forks.

Proper use of the machine and/or equipment includes the following:

- Observance of the operating manual at all times.
- Observance of the technical data on the identification plate on the attachment.
- Adherence to the specified inspection and maintenance instructions.
3.2 Improper use

- Exceeding the allowable load capacity and load centre.
- Dragging or pushing loads with the attachment
- It is not permitted to clamp loads.
- Transporting persons with the load or load handling devices
- Mounting auxiliary equipment on the attachment such that the original mode of usage is changed, (e.g. fork extensions) must be authorised by the manufacturer.
- To prevent damage of the toothed belt, the conveyor must no longer be driven as soon as the load touches the fork back.

4. Installation and checking out

4.1 Installation

Installation and commissioning should be performed by qualified and authorised personnel only.

Pay attention to a sufficient load-carrying capacity of the lifting means.

The following are examples of preferred lifting means:

- Capacity 250 kg/M16
  - Part-no. 9710160008

- Capacity 1200 kg/M16
  - Part-no. 0360010201

- Capacity 2000 kg/M16
  - Part-no. 0360010301
• Hoist the attachment at the positions indicated (1).

• Demount the lower hooks (2).

• Mount the attachment on the fork carriage of the lift truck (3).

• Check that the attachment is correctly seated in the centre lock (4).

• Mount the lower hooks (2), tightening the screws (5) with a torque of 190 Nm.

• Connect the hydraulic ports (6, 7) by means of pipes or hoses to the hydraulic ports on the lift truck.

• Before initial operation, check the functions and the identification of the attachment with the movement directions of the operating elements (operating lever, joystick, etc.).
• Mount the residual carrying capacity notice and identification of the operating elements (if not already present) of the combination of lift truck/attached equipment on the lift truck.

4.2 Checking out

KAUP-attachments are delivered pre-lubricated. If the attachment has been in storage for a longer period, we recommend that it be lubricated again before being placed in service. See 6. Maintenance and onwards.

Failure of the safety devices (e.g. the pressure relief valve and the non-return valve) and incorrect connection of the controls to the actuators can cause malfunctioning of the attachment and damage to it.

After mounting and before initial operation, check the functions and the identification of the attached equipment with the movement directions of the operating elements (operating lever, joystick, etc.).

4.2.1 Bleeding the hydraulic system

• Start the lift truck.
• Start the toothed belt and operate it in forward and reverse directions several times.
• Extend and retract the left and right transport forks several times.
• Extend and retract the sideshift several times.
• Inspect the hydraulic connections for leakage.

4.2.2 Adjustment after putting into service

The hydraulic system is under pressure. During work on hydraulic components oil spurting out can cause injuries. Unload the system in accordance with the operating instructions of the lift truck manufacturer. In the case of injuries caused by high pressure oil, inform the works physician and seek out a specialist immediately.

5. Operation

5.1 General

At least once per working shift, the machine and equipment must be inspected for visible damage and defects. Repeat faults to your superior and have them rectified without delay.

Be aware of persons present in the area where you are working or driving and ensure that they are not endangered.

Do not transport any load exceeding that specified on the residual load plate for the particular combination of lift truck and attachment.
Note the load-bearing capacity of the attachment as stated on the rating plate. This figure always represents the load carried by two or more fork arms.

The nominal capacity of the forks must exceed the load.

5.2 Load handling

Position the lifting frame vertically and pick up the load centred and parallel to the floor.

Always transport pallets, boxes and containers using four forks.

Move the fork arm beneath the load to engage the rubber transport pad.

Pull/move the picked-up load fully back and then switch the conveyors off.

Raise the load about 300 mm and tilt the mast backwards.

Centre the load to the middle of the lift truck during take-up and transport.

Note the change in the centre of gravity of the load when moving the load. Stability of the lift truck!

5.3 Driving

Ensure that pallets, boxes, containers and packaging are in good condition.

Do not drive with the mast tilted forward.

Only drive with the load back to the limit stop!

Take care when driving that neither the attachment nor the load comes into contact with the ground.

Ensure that multiple items stacked on top of one another are securely fastened.
6. Maintenance and servicing

6.1 General

Regular maintenance is essential to ensure reliable operation and long service life of the KAUP attachment.

Ensure that maintenance and servicing are performed by qualified and authorised personnel only.

Lubrication and cleaning work on the attachment may also be performed by the lift truck operator.

Perform maintenance and servicing work only when the attachment is parked securely on a stable, level foundation. For installing and removing, it is recommended to use a pallet to take the attachment. The attachment can thus be securely placed and transported.

Pay attention to a sufficient load-carrying capacity of the stop device.

Replace missing or defective warning signs on the attachment.

Do not use third party spare parts. Through poor quality or incorrect matching they can result in a risk of accident. The EC Declaration of Conformity by the manufacturer becomes invalid and you assume full responsibility in the case of accident.

Use only original spare parts from the manufacturer.

The hydraulic system is under pressure. During work on hydraulic components oil spurting out can cause injuries. Unload the system in accordance with the operating instructions of the lift truck manufacturer. In the case of injuries caused by high pressure oil, inform the works physician and seek out a specialist immediately.

Screw connections can loosen due to vibration of the attachment. During routine maintenance check that screw connections are correctly torqued and replace screws which are visibly damaged.

Note the following tightening torques which are valid for screws with connecting surfaces according to ISO 4762, ISO 4014, ISO 4032 etc.:

<table>
<thead>
<tr>
<th>Screw/bolt rating</th>
<th>8.8</th>
<th>10.9</th>
<th>12.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>M6 thread</td>
<td>9,3Nm</td>
<td>14Nm</td>
<td>16Nm</td>
</tr>
<tr>
<td>M8 thread</td>
<td>23Nm</td>
<td>33Nm</td>
<td>39Nm</td>
</tr>
<tr>
<td>M10 thread</td>
<td>45Nm</td>
<td>66Nm</td>
<td>77Nm</td>
</tr>
<tr>
<td>M12 thread</td>
<td>77Nm</td>
<td>115Nm</td>
<td>135Nm</td>
</tr>
<tr>
<td>M16 thread</td>
<td>190Nm</td>
<td>280Nm</td>
<td>330Nm</td>
</tr>
<tr>
<td>M20 thread</td>
<td>385Nm</td>
<td>550Nm</td>
<td>640Nm</td>
</tr>
</tbody>
</table>
Failure of the safety devices (e.g. the pressure relief valve and the non-return valve) and incorrect connection of the controls to the actuators can cause malfunctioning of the attachment and damage to it.

After mounting and before initial operation, check the functions and the identification of the attached equipment with the movement directions of the operating elements (operating lever, joystick, etc.).

6.2 Significant modification

Significant modifications are, for example, those which affect the stability, performance, speed and strength of components.

The EC Declaration of Conformity is invalidated by a significant modification of the attachment.

Modifications to the attachment may only be made with prior approval by the manufacturer.

6.3 Schedule for routine maintenance and lubricants

<table>
<thead>
<tr>
<th>Lubricants approved and recommended by KAUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greases</td>
</tr>
<tr>
<td>Lithium soap grease</td>
</tr>
<tr>
<td>NLGI Class 2</td>
</tr>
<tr>
<td>e.g. Avialith 2</td>
</tr>
<tr>
<td>Designation DIN51825: K 2 K-30</td>
</tr>
<tr>
<td>Complex soap grease</td>
</tr>
<tr>
<td>NLGI Class 2</td>
</tr>
<tr>
<td>e.g. Turmogrease Gel M 5</td>
</tr>
<tr>
<td>Foundry quality</td>
</tr>
<tr>
<td>Teflon spray</td>
</tr>
<tr>
<td>e.g. Wieds or Rivolta</td>
</tr>
<tr>
<td>Only for plastic sections</td>
</tr>
</tbody>
</table>

Hydraulic fluids according to ISO VG, DIN 51519, HLP, DIN 51524, degree of purity as per Class 18/13 according to ISO 4406 or better.

The specified maintenance schedules can change as a result of the operating conditions such as extreme cold, heat and dust or poor ground conditions and this must be taken into account by the owner.

With other loads, such as fork arms with a length of over 2,400 mm or raised load centres, amended/shorter maintenance intervals should be agreed by the user with the manufacturer.
Daily

Check all toothed belts (1), lines, hoses and connections for leakage and damage.
After 50h / every 500h thereafter

Check screws:

- (2, 3) on the fork tip (4).
- (5) on the lid (6).
- (7) at the support roller brackets (8).
- (9) on the hooks (10).
- (11, 12, 13, 14) at the forks (15).

Replace loose or damaged screws. Torque the screws as specified in Chapter 6.1 General.

Weekly

Grease:

- Sliding pieces (16) by way of the greasing nipples (17) and the lubricating pipe (18).

Every 200h

Check wear on:

- fork tip (2).
- Sliding pieces (16).
- Supporting rollers (28) on the support roller brackets (8).

As necessary

Replace the worn fork tip (4) by loosening the nut (19) and bolt (2) to release tension of the toothed belt (1). Remove countersunk bolts (3) and pin (20). Pull the fork strip (4) off to the front. Replace the worn part. Move the fork tip (4) onto the forks (15) and reinstall pin (20) and countersunk bolt (3). Tension the toothed belt (1) by installing the nut (19) and bolt (2).

Replace worn sliding pieces (16) by removing the bolts (9) including hooks (10) and nut (21) of the cylinder (22). Lift the transport fork off the fork carriage of the lift truck in upward direction. Replace the sliding pieces (16). Ensure correct seating of the sliding pieces (16) during installation. Place the transport fork with guide (23) onto the fork carriage of the lift truck, install the cylinder (22) using the nut (21) and the hooks (10) using the bolts (9).

Replace faulty supporting rollers (29) by removing the bolts (9) and hooks (10). Tilt the transport fork forward off the fork carriage of the lift truck so that the supporting roller (28) no longer rests, and secure this position. Remove the cotter pin (24) of the pin (25) and tap the pin (25) out of the supporting roller mount. Replace faulty supporting rollers (28) and install the pin (25) and cotter pin (24). Tilt the transport fork back onto the fork carriage of the lift truck and install the hooks (10) using bolts (9).
Replace the faulty cylinders (22, 26) by removing the hydraulic lines from the cylinder (22, 26) with the hydraulic system depressurised. Remove the nuts (21, 27) and replace the cylinders (22, 26). Reinstall the nuts (21, 27) and the hydraulic lines.

After installing or removing a cylinder (22, 26), always check the clearance between the cylinder mount and nut (21, 27) of the cylinder (22, 26). Cylinders are installed with axial clearance of 1.5 to 2 mm.

Replace faulty pinions (29, 20, 31): To be done by KAUP Customer Service only.

6.3.2 Identification plate and caution board
7. Troubleshooting

Troubleshooting should only be performed by qualified and authorised personnel.

<table>
<thead>
<tr>
<th>Fault</th>
<th>Possible cause</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Transport forks</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>While transporting</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Slow/sluggish lifting operation.</td>
<td>Insufficient fluid flow from truck's hydraulics</td>
<td>Increase flow rate of truck's hydraulics</td>
</tr>
<tr>
<td>☐ Rattle noise during lifting.</td>
<td>Pinion defektive</td>
<td>Replace pinion KAUP customer service</td>
</tr>
<tr>
<td>☐ Does not lift.</td>
<td>Overload condition.</td>
<td>Check weight of load.</td>
</tr>
<tr>
<td>☐</td>
<td>Hydraulic motor failed.</td>
<td>Replace hydraulic motor. KAUP customer service</td>
</tr>
<tr>
<td>☐ Jerky lifting operation.</td>
<td>Oil flow disrupted.</td>
<td>Increase oil flow.</td>
</tr>
</tbody>
</table>
### Fault Possible cause Correction

#### Sideshifter

<table>
<thead>
<tr>
<th>Fault</th>
<th>Possible cause</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>When shifting</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Too slow</td>
<td>Insufficient fluid flow from truck's hydraulics</td>
<td>Increase flow rate of truck's hydraulics</td>
</tr>
<tr>
<td>☐ Jerky shifting action</td>
<td>Defective supporting roller</td>
<td>Replace supporting roller</td>
</tr>
<tr>
<td>☐ Supporting roller does not rotate</td>
<td>Supporting roller is defective</td>
<td>Replace supporting roller</td>
</tr>
<tr>
<td>☐ Guide scrapes on the conduit</td>
<td>Slider is worn</td>
<td>Replace slider</td>
</tr>
</tbody>
</table>

#### Fork adjustment

<table>
<thead>
<tr>
<th>Fault</th>
<th>Possible cause</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Moves too slowly.</td>
<td>Insufficient fluid flow from truck's hydraulics</td>
<td>Increase flow rate of truck's hydraulics</td>
</tr>
</tbody>
</table>

#### Oil leakage

<table>
<thead>
<tr>
<th>Fault</th>
<th>Possible cause</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ At cylinder</td>
<td>Screw fitting is leaking</td>
<td>Tighten / seal screw fitting</td>
</tr>
<tr>
<td></td>
<td>Sealing kit defective</td>
<td>Replace sealing kit</td>
</tr>
<tr>
<td></td>
<td>Piston rod scored</td>
<td>Replace piston rod and sealing kit</td>
</tr>
<tr>
<td></td>
<td>Fitting loose.</td>
<td>Retighten fitting.</td>
</tr>
<tr>
<td></td>
<td>Shaft seal faulty.</td>
<td>Renew shaft seal.</td>
</tr>
</tbody>
</table>

### 8. Disposal

Prevent environmental damage by disposing of the following items properly in accordance with relevant national regulations:

- ☐ Hydraulic fluids, greases, lubricants and soiled working materials (Cleaning rags, etc.)
- ☐ Packaging material (Pallets, straps, cartons and plastic sheeting)

After decommissioning, the attachment should be disposed of in accordance with local legislation and regulations.

### 9. Transport

During transport of the attachment, care should be given to using appropriate means of support (e.g. pallets). These must not be damaged. The attachment must be secured against slipping or tipping over on the support.
10. **Decommissioning and storage**

If the attachment is to be stored for an extended period, the clutches must be sealed against contamination and damage. Store the attachment in a clean, dry environment.

11. **Spare parts list** (not part of the Operating Manual)

12. **EC Declaration of Conformity (Summary)**

KAUP GMBH & Co. KG • Braunstraße 17 • D-63741 Aschaffenburg

we hereby declare that the machinery

<table>
<thead>
<tr>
<th>Model:</th>
<th>Adjustable conveyor fork</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type:</td>
<td>1,8T 180FG-2-4, 1,8T 180FG-2-4SV</td>
</tr>
</tbody>
</table>

conforms to the latest valid version of the Machinery Directive 2006/42/EG.

The person authorised to compile the technical documents:

see EC-Declaration of Conformity

KAUP GmbH & Co. KG